5EF-TR-68-1

THE OCCURRENCE AND KNOWN HUMAN-DISEASE RELATIONSHIPS OF MOSQUITOES ON USAF INSTALLATIONS IN THE REPUBLIC OF VIETNAM

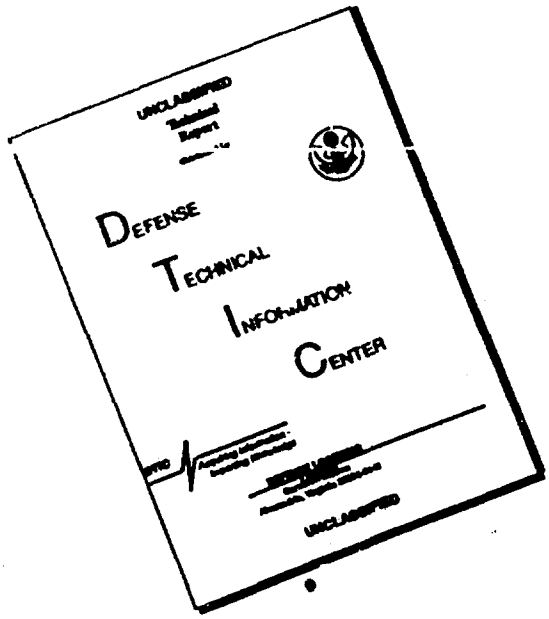
July 1968

Distribution of this Document is Unlimited

USAF 5th Epidemiological Flight
Aerospace Medical Division
Air Force Systems Command
APO San Francisco 96528

31

DISCLAIMER NOTICE



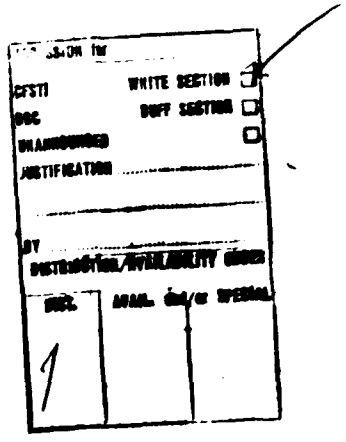
THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

BLANK PAGE

NOTICES

When U.S. Government drawings, specifications, or other data are used for any purpose other than a definitely related Government procurement operation, the Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise, as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Qualified requesters may obtain copies from the Defense Documentation Center (DDC), Cameron Station, Alexandria, Virginia 22314. Others will be expedited if placed through the librarian or other person designated to request documents from DDC (formerly ASTIA).



THE OCCURRENCE AND KNOWN HUMAN-DISEASE RELATIONSHIPS OF MOSQUITOES ON USAF INSTALLATIONS IN THE REPUBLIC OF VIETNAM

DALE W. PARRISH, Major, USAF, BSC

FOREWORD

This research was accomplished at the 5th Epidemiological Flight under Project 6321, Task 02, and is part of the program for support of USAF operations in Southeast Asia.

The author acknowledges the careful and skillful technical assistance of SMSgt John P. Burns, J. L. Libay and R. C. Basio.

This report has been reviewed and is accepted.

Paul W. Musgrave

PAUL W. MUSGRAVE
Colonel, USAF, MC
Commander

ABSTRACT

Data are presented on the occurrence and human-disease relationships of mosquitoes on USAF installations located in the Republic of Vietnam.

The information contained in this report is based upon the identification of mosquito specimens collected and submitted to the USAF 5th Epidemiological Flight by USAF Military Public Health Service personnel from 10 USAF installations in RVN over a 24-month period between 1 June 1966 and 1 June 1968. Mosquito surveys were accomplished on a routine basis in connection with the conduct of disease-vector surveillance and control programs in compliance with the objectives of the USAF Aerospace Medicine Program to prevent and control vector-borne diseases.

A total of 93 different species of mosquitoes were identified from all collections. Of this number, 26 species or 27.9 percent, are known vectors of human disease.

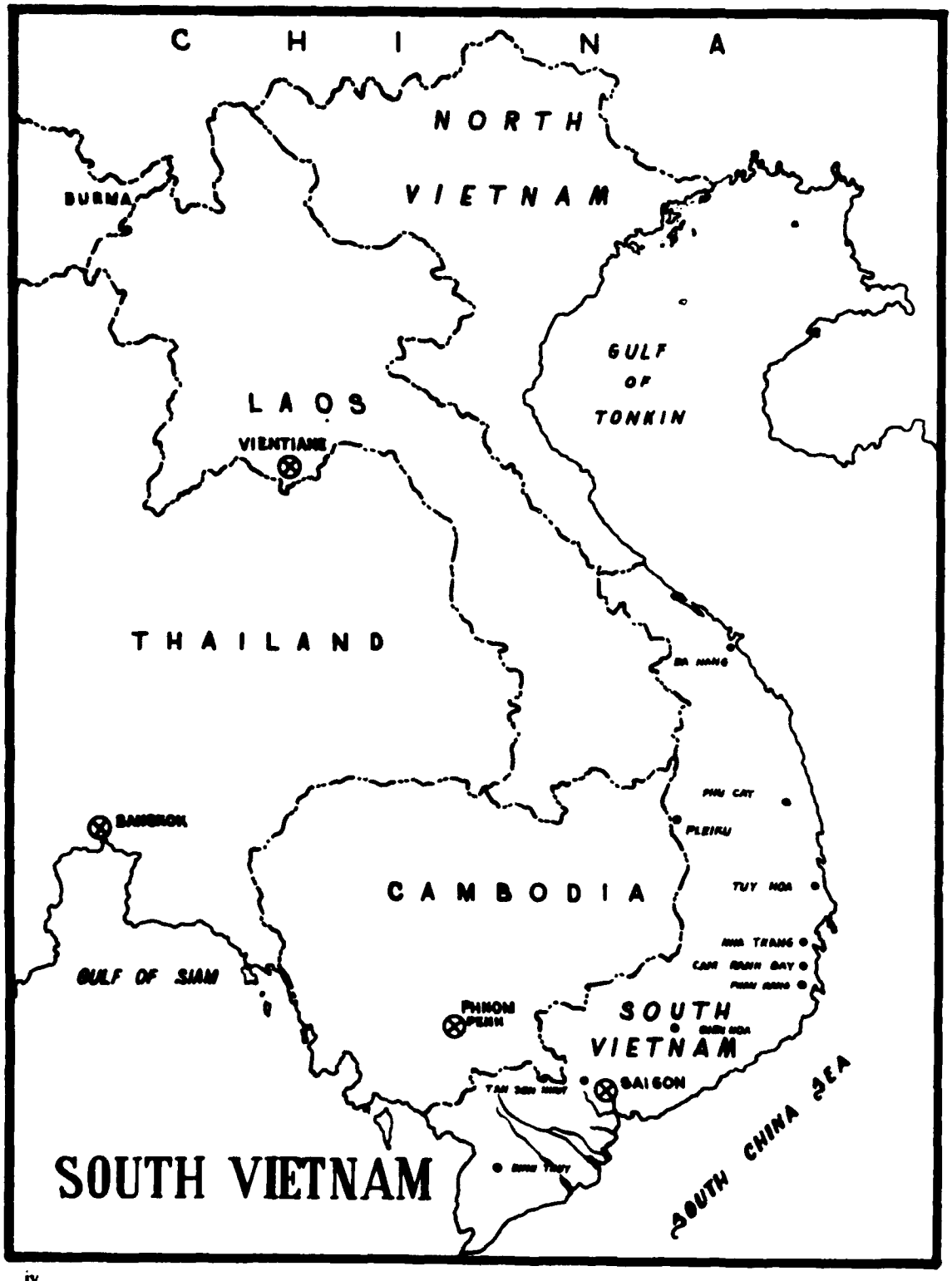

C H I N A
NORTH
VIETNAM
BURMA
GULF
OF
TONKIN
LAOS
VIENTIANE
THAILAND
PHU CAT
PLEIKU
BANGKOK
CAMBODIA
TUY HOA
GULF OF SIAM
PHNOM
PENH
SOUTH
VIETNAM
SAIGON
SOUTH VIETNAM
SOUTH CHINA SEA

FIGURE 1.

THE OCCURRENCE AND KNOWN HUMAN-DISEASE RELATIONSHIPS OF MOSQUITOES ON USAF INSTALLATIONS IN THE REPUBLIC OF VIETNAM

SECTION I

INTRODUCTION

The data presented herein are based upon the identification of mosquito specimens collected and submitted to the USAF 5th Epidemiological Flight by USAF Military Public Health Service Personnel from 10 U. S. Air Force Installations in the Republic of Vietnam over a 20-month period, between 1 June 1966 and 1 June 1968. The locations of installations participating in these surveys are shown in Figure I.

Mosquito surveys were accomplished on a routine basis in connection with the conduct of disease-vector surveillance and control programs in compliance with the objectives of the USAF Aerospace Medicine Program to prevent and control vector-borne diseases.

Information derived from these continuing surveys on the occurrence and seasonal abundance of specific species provides the Base Preventive Medicine Officer with the necessary data to evaluate the medical and economical importance of a species, to establish the vector-disease relationship, to maintain vigilance over potential vectors and to recommend effective and practical means of control.

SECTION II

METHODS

Adult and immature forms were collected at each installation on a routine basis utilizing standard entomological techniques. Immature forms were collected from two representative aquatic environments, while mosquito light traps were operated to collect adult mosquitoes at a minimum of two representative locations. Collected specimens were preserved, packaged and mailed to the 5th Epidemiological Flight in accordance with standard entomological procedures.

Steroscopic examinations were made of all specimens and species determinations rendered by entomology specialists trained in mosquito taxonomy.

SECTION III

DISCUSSION

A total of 94 different species of mosquitoes were identified from all collections received from Air Force Installations in the Republic of Vietnam. (Table I). Of this number, 26 species or 27.9 percent are known vectors of human disease. (Table II). The occurrence of species by month over a 24-month period is listed in Table III.

Mosquito-borne diseases, with the exception of malaria, have not been as serious in Vietnam as had been expected. Dengue and encephalitis are present, but little or no filariasis or hemorrhagic fever has been reported. The total number of confirmed malaria cases in U. S. Forces during 1965-1966 has exceeded 10,000 (1).

The distribution of malaria in RVN is highly discontinuous. Incidence is very low in most of the coastal plain including the cities and delta. In parts of the foothills and highlands the attack rate is extremely high. Most of the military malaria is contracted outdoors rather than indoors and there is considerable eviden e that the endophilic *Anopheles minimus* has not been a significant vector. The exophilic species, *A. aconitus*, *A. maculatus*, *A. jeyporiensis candidiensis*, and in limited areas, *A. balabacensis*, are believed to be the most important vectors affecting military personnel (1).

The extraordinary amount of personnel movements is causing a redistribution of malaria from the hyperendemic foci of the interior to all parts of RVN and beyond. Wherever suitable vectors occur malaria has increased as new reservoirs are established. The Navy reports that at least two cases of autochthonous malaria introduced from Vietnam have occurred on Guam. A major portion of the 517 cases of imported malaria reported in the United States during 1966 originated in Vietnam.

The amount of illness diagnosed as "fever of indetermined origin" (FUO) exceeds that of confirmed malaria and Army authorities have estimated that one-third or more of this may be dengue. The incidence of FUOs in military personnel of all military services in Southeast Asia has averaged 8% (2).

TABLE I

LIST OF MOSQUITO SPECIES COLLECTED IN THE REPUBLIC OF VIETNAM

INSTALLATION	SPECIES	
Bien Hoa	*Aedes mediolineatus*	*Culex fuscanus*
	Aedes poicilius	*Culex fuscocephalus**
	*Aedes vexans**	*Culex gelidus**
	Anopheles annularis	*Culex rubithoracis*
	Anopheles lesteri	*Culex pipiens quinquefasciatus**
	Anopheles peditaeniatus	*Culex sinensis**
	*Anopheles sinensis**	*Culex tritaeniorhynchus**
	Anopheles splendidus	*Culex whitmorei*
	Anopheles subpictus	*Ficalbia hybrida*
	*Anopheles vagus**	*Ficalbia luzonensis*
	*Culex annulus**	*Mansonia crassipes*
	*Culex bitaeniorhynchus**	*Mansonia ochracea*
	Culex brevipalpis	*Mansonia uniformis**
Binh Thuy	*Aedes dux*	*Culex fuscocephalus**
	*Aedes lineatopennis**	*Culex gelidus**
	Aedes niveoscutellum	*Culex pholeter*
	Aedes poicilius	*Culex nigropunctatus*
	Aedeomyia catasticta	*Culex pseudovishnui*
	*Anopheles aconitus**	*Culex pipiens quinquefasciatus**
	Anopheles argyropus	*Culex raptor*
	*Anopheles barbirostris**	*Culex sinensis**
	*Anopheles campestris**	*Culex tritaeniorhynchus**
	Anopheles crawfordi	*Ficalbia chamberlaini*
	Anopheles indiensis	*Ficalbia hybrida*
	Anopheles lesteri	*Ficalbia luzonensis*
	*Anopheles minimus**	*Ficalbia minima*
	*Anopheles nigerrimus**	*Hodgesia malayi*
	Anopheles peditaeniatus	*Mansonia annulifera**
	*Anopheles sinensis**	*Mansonia crassipes*
	Anopheles subpictus	*Mansonia nigrosignata*
	*Anopheles tessellatus**	*Mansonia ochracea*
	*Anopheles umbrosus**	*Mansonia uniformis**
	*Anopheles vagus**	*Uranotaenia annandalei*
	*Culex annulus**	*Uranotaenia campestris*
	*Culex bitaeniorhynchus**	*Uranotaenia maxima*
	Culex brevipalpis	*Uranotaenia obscura*
	Culex fuscanus	
Cam Ranh Bay	*Aedes albolineatus*	*Anopheles lesteri*
	*Aedes albopictus**	*Anopheles peditaeniatus*
	Aedes imprimens	*Anopheles sinensis**
	Aedes pseudoalbopictus	*Anopheles subpictus*
	*Aedes vexans**	*Culex annulus**
	Aedeomyia catasticta	*Culex bitaeniorhynchus**
	Anopheles crawfordi	*Culex fuscanus*
	Anopheles karwari	*Culex fuscocephalus**

	*Culex gelidus**	*Ficalbia chamberlaini*
	Culex mimeticus	*Ficalbia luzonensis*
	Culex pseudosinensis	*Mansonia crassipes*
	Culex pseudovishnui	*Mansonia ochracea*
	Culex quadripalpis	*Mansonia uniformis**
	*Culex pipiens quinquefasciatus**	*Toxorhynchites splendens*
	*Culex tritaeniorhynchus**	*Tripteroides aranoides*
	Culex whitei	
DaNang	*Anopheles aconitus*	*Culex fuscocephalus**
	*Anopheles sinensis**	*Culex gelidus**
	*Anopheles vagus**	*Culex rubithoracis*
	*Culex annulus**	*Culex pseudovishnui*
	*Culex bitaeniorhynchus**	*Culex pipiens quinquefasciatus**
	Culex fuscanus	*Culex tritaeniorhynchus**
Nha Trang	*Aedes chrysolineatus*	*Culex brevipalpis*
	Aedes dux	*Culex fuscocephalus**
	Aedes gubernatoris	*Culex gelidus**
	*Aedes lineatopennis**	*Culex khazani*
	Aedes pseudoalbopictus	*Culex pholeter*
	*Aedes vexans**	*Culex nigropunctatus*
	*Aedes vigilax**	*Culex pseudosinensis*
	*Anopheles aconitus**	*Culex pseudovishnui*
	Anopheles annularis	*Culex pipiens quinquefasciatus**
	Anopheles argyropus	*Culex sinensis**
	Anopheles crawfordi	*Culex sitiens**
	Anopheles lesteri	*Culex tritaeniorhynchus**
	*Anopheles minimus**	*Culex whitei*
	*Anopheles nigerrimus**	*Culex whitmorei*
	Anopheles peditaeniatus	*Ficalbia chamberlaini*
	Anopheles philippinensis	*Ficalbia luzonensis*
	*Anopheles sinensis**	*Malaya jacobsoni*
	Anopheles subpictus	*Mansonia crassipes*
	*Anopheles tessellatus**	*Mansonia uniformis**
	*Anopheles vagus**	*Uranotaenia annandalei*
	*Culex annulus**	*Uranotaenia campestris*
	*Culex bitaeniorhynchus**	*Uranotaenia macfarlanei*
Phan Rang	*Aedes albopictus**	*Anopheles annularis*
	Aedes alboscutellatus	*Anopheles argyropus*
	Aedes dux	*Anopheles crawfordi*
	*Aedes lineatopennis**	*Anopheles indiensis*
	Aedes mediolineatus	*Anopheles lesteri*
	Aedes niveoscutellum	*Anopheles minimus**
	Aedes pseudoalbopictus	*Anopheles nigerrimus**
	Aedes taeniorhynchoides	*Anopheles pallidus*
	*Aedes vexans**	*Anopheles peditaeniatus*
	*Aedes vigilax**	*Anopheles philippinensis*
	Aedeomyia catasticta	*Anopheles sinensis**
	*Anopheles aconitus**	*Anopheles subpictus*

*Anopheles tessellatus**
*Anopheles vagus**
*Culex annularis**
*Culex bitaeniorhynchus**
Culex fuscanus
*Culex fuscocephalus**
*Culex gelidus**
Culex khazani
Culex minor
Culex pholeter
Culex reidi
Culex rubithoracis
Culex nigropunctatus
Culex pseudosinensis
Culex pseudovishnui
*Culex pipiens quinquefasciatus**
*Culex sitiens**
*Culex tritaeniorhynchus**
Culex whitmorei
Mansonia crassipes
Mansonia ochracea
*Mansonia uniformis**
Uranotaenia maxima
Uranotaenia obscura
Uranotaenia recondita

Pleiku

*Aedes albopictus**
Aedes gubernatoris
Aedes laniger
*Aedes lineatopennis**
Aedes mediolineatus
Aedes niveoscutellum
Aedes ostentatio
Aedes pseudoalbopictus
*Aedes vexans**
Aedes vittatus
Aedeomyia catasticta
*Anopheles aconitus**
Anopheles annularis
Anopheles argyropus
Anopheles crawfordi
Anopheles indiensis
Anopheles karwari
Anopheles lesteri
*Anopheles maculatus**
*Anopheles minimus**
*Anopheles nigerrimus**
Anopheles pallidus
Anopheles peditaeniatus
Anopheles philippinensis
*Anopheles sinensis**
Anopheles splendidus
Anopheles subpictus
*Anopheles vagus**
Armigeres flavus
*Armigeres subalbatus**
*Culex annulus**
*Culex bitaeniorhynchus**
Culex brevipalpis
Culex fuscanus
*Culex fuscocephalus**
*Culex gelidus**
Culex pholeter
Culex nigropunctatus
Culex pseudosinensis
Culex pseudovishnui
*Culex pipiens quinquefasciatus**
*Culex sinensis**
*Culex sitiens**
*Culex tritaeniorhynchus**
Culex whitei
Culex whitmorei
Ficalbia chamberlaini
Hodgesia malayi
Mansonia crassipes
*Mansonia uniformis**
Uranotaenia annandalei
Uranotaenia macfarlanei
Uranotaenia maxima

Phu Cat

*Aedes aegypti**
Aedes amesi
*Aedes lineatopennis**
Aedes longirostris
Aedes mediolineatus
Aedes ostentatio
Aedes poicilius
Aedes vexans
Aedes vittatus
Aedeomyia catasticta
*Anopheles aconitus**
Anopheles annandalei interruptus
Anopheles annularis
Anopheles argyropus
*Anopheles barbirostris**
*Anopheles campestris**

	Anopheles crawfordi	*Culex fuscanus*
	Anopheles indiensis	*Culex fuscocephalus**
	*Anopheles jeyporiensis candidiensis**	*Culex gelidus**
		Culex khazani
	Anopheles karwari	*Culex incomptus*
	Anopheles lesteri	*Culex peytoni*
	*Anopheles minimus**	*Culex pholeter*
	*Anopheles nigerrimus**	*Culex pseudosinensis*
	Anopheles pallidus	*Culex pseudovishnui*
	Anopheles peditaeniatus	*Culex pipiens quinquefasciatus**
	Anopheles philippinensis	*Culex sinensis**
	*Anopheles sinensis**	*Culex tritaeniorhynchus**
	Anopheles subpictus	*Culex whitmorei*
	*Anopheles tessellatus**	*Ficalbia chamberlaini*
	*Anopheles umbrosus**	*Ficalbia luzonensis*
	*Anopheles vagus**	*Ficalbia minima*
	Anopheles varuna	*Mansonia crassipes*
	*Armigeres subalbatus**	*Mansonia uniformis**
	*Culex annulus**	*Uranotaenia campestris*
	*Culex bitaeniorhynchus**	*Uranotaenia maxima*
	Culex brevipalpis	*Uranotaenia obscura*
Tan Son Nhut	*Aedes aegypti*	*Culex brevipalpis*
	Aedes dux	*Culex fuscanus*
	Aedes vexans	*Culex fuscocephalus**
	*Anopheles aconitus**	*Culex gelidus**
	Anopheles annularis	*Culex pipiens quinquefasciatus**
	Anopheles crawfordi	*Culex raptor*
	Anopheles philippinensis	*Culex sinensis**
	*Anopheles sinensis**	*Culex tritaeniorhynchus**
	Anopheles subpictus	*Culex whitmorei*
	*Anopheles tessellatus**	*Ficalbia chamberlaini*
	*Anopheles vagus**	*Malaya jacobsoni*
	*Culex annulus**	
Tuy Hoa	*Aedes dux*	*Culex annulus**
	*Aedes lineatopennis**	*Culex bitaeniorhynchus**
	Aedes longirostris	*Culex gelidus**
	*Aedes vexans**	*Culex pipiens quinquefasciatus**
	Aedeomyia catasticta	*Culex tritaeniorhynchus**
	Anopheles annularis	*Culex whitmorei*
	Anopheles crawfordi	*Mansonia crassipes*
	Anopheles peditaeniatus	*Mansonia ochracea*
	*Anopheles sinensis**	*Mansonia uniformis*
	Anopheles subpictus	*Tripteroides aranoides*
	*Anopheles vagus**	

* Disease Vectors

TABLE II

KNOWN HUMAN DISEASE RELATIONSHIPS OF MOSQUITOES COLLECTED ON 7TH AIR FORCE INSTALLATIONS (RVN)

AEDES AEGYPTI

Disease Relationships: Primary vector of DENGUE and CHIKUNGUNYA FEVER; found naturally infected with *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

AEDES ALBOPICTUS

Disease Relationships: Primary vector of DENGUE and CHIKUNGUNYA FEVER; secondary vector of JAPANESE "B" ENCEPHALITIS; primary vector of *Dirofilaria immitis* (TROPICAL EOSINOPHILIA).

AEDES LINEATOPENNIS

Disease Relationships: Low potential vector of *Brugia malayi* (MALAYAN FILARIASIS) and *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

AEDES VEXANS

Disease Relationships: Primary vector of *Dirofilaria immitis* (TROPICAL EOSINOPHILIA); secondary vector of JAPANESE "B" ENCEPHALITIS.

AEDES VIGILAX

Disease Relationships: Primary vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS) and SINDBIS FEVER.

ANOPHELES ACONITUS

Disease Relationships: Secondary vector of MALARIA in the highlands.

ANOPHELES BARBIROSTRIS

Disease Relationships: Primary vector of *Burgia malayi* (MALAYAN FILARIASIS); secondary vector of *Brugia pahangi* (TROPICAL EOSINOPHILIA).

ANOPHELES CAMPESTRIS

Disease Relationships: Primary vector of *Brugia malayi* (MALAYAN FILARIASIS); secondary vector of *Brugia pahangi* (TROPICAL EOSINOPHILIA).

ANOPHELES JEYPORIENSIS CANDIDIENSIS

Disease Relationships: Primary vector of highland MALARIA. Possible vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

ANOPHELES MACULATUS

Disease Relationships: Secondary vector of MALARIA in the highlands.

ANOPHELES MINIMUS

Disease Relationships: Primary vector of highland MALARIA; secondary vector of coastal MALARIA (in sand dune seepage areas); primary vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

ANOPHELES NIGERRIMUS

Disease Relationships: May possibly transmit MALARIA. Some positive records represent confusion between this species and *Anopheles sinensis*.

ANOPHELES SINENSIS

Disease Relationships: Primary vector of MALARIA in delta and coastal areas. Primary vector of *Brugia malayi* (MALAYAN FILARIASIS) and *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

ANOPHELES TESSELLATUS

Disease Relationships: Secondary vector of MALARIA in delta and coastal areas.

ANOPHELES UMBROSUS

Disease Relationships: Possible jungle vector of MALARIA in the lowlands.

ANOPHELES VAGUS

Disease Relationships: Vector of MALARIA in delta and coastal areas.

ARMIGERES SUBALBATUS

Disease Relationships: Primary vector of *Brugia pahangi* (MALAYAN FILARIASIS).

CULEX ANNULUS

Disease Relationships: Vector of JAPANESE "B" ENCEPHALITIS.

CULEX BITAENIORHYNCHUS

Disease Relationships: Primary vector of SINDBIS FEVER; secondary vector of JAPANESE "B" ENCEPHALITIS.

CULEX FUSCOCEPHALUS

Disease Relationships: Primary vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

CULEX GELIDUS

Disease Relationships: Primary vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS), CHIKUNGUNYA FEVER, JAPANESE "B" ENCEPHALITIS and GETAH VIRUS.

CULEX PIPIENS QUINQUEFASCIATUS

Disease Relationships: Primary vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS), *Brugia malayi* (MALAYAN FILARIASIS), *Dirofilaria immitis* (TROPICAL EOSINOPHILIA); secondary vector of JAPANESE "B" ENCEPHALITIS.

CULEX SINENSIS

Disease Relationships: Low potential vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

CULEX SITIENS

Disease Relationships. Possible vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS) and, based upon small samplings, of *Brugia malayi* (MALAYAN FILARIASIS).

CULEX TRITAENIORHYNCHUS

Disease Relationships: Primary vector of JAPANESE "B" ENCEPHALITIS, CHIKUNGUNYA FEVER, SINDBIS FEVER, and GETAH VIRUS. Low potential vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS).

MANSONIA ANNULIFERA

Disease Relationships: Primary vector of *Brugia malayi* (MALAYAN FILARIASIS).

MANSONIA UNIFORMIS

Disease Relationships: Primary vector of *Wuchereria bancrofti* (BANCROFTIAN FILARIASIS), *Brugia malayi* (MALAYAN FILARIASIS), *Brugia pahangi* (TROPICAL EOSINOPHILIA) and CHIKUNGUNYA FEVER.

TABLE III – A

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

BIEN HOA, VIETNAM

SPECIES	MONTHS																							
	1966							1967												1968				
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes mediolineatus	NA	NA	N	NA	NA	NA	NA	NA	N	NA	NA	N	N	N	P	N	NA	N	N	NA	NA	NA	NA	N
Aedes poicilius	NA	NA	N	NA	NA	NA	NA	NA	N	NA	NA	P	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Aedes vexans	N	N	N	N	N	N	N	NA	N	NA	NA	N	N	N	N	N	NA	P	N	NA	NA	NA	NA	N
Anopheles annularis	N	N	N	N	N	N	N	NA	P	NA	NA	N	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Anopheles lesteri	N	N	N	N	N	N	N	NA	P	NA	NA	N	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	NA	P	NA	NA	N	N	P	N	N	NA	N	N	NA	NA	NA	NA	N
Anopheles sinensis	N	N	N	N	N	N	N	NA	P	NA	NA	N	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Anopheles splendidus	N	N	N	N	N	N	N	NA	P	NA	NA	N	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Anopheles subpictus	N	N	N	N	N	N	N	NA	N	NA	NA	P	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Anopheles vagus	N	N	N	N	N	N	N	NA	P	NA	NA	N	P	N	N	N	NA	N	N	NA	NA	NA	NA	N
Culex annulus	N	N	N	N	N	N	N	NA	P	NA	NA	P	P	N	N	P	NA	P	N	NA	NA	NA	NA	N
Culex bitaeniorhynchus	N	N	N	N	N	N	N	NA	N	NA	NA	P	P	N	N	P	NA	N	N	NA	NA	NA	NA	N
Culex brevipalpis	N	N	N	N	N	N	N	NA	N	NA	NA	P	P	N	N	N	NA	N	N	NA	NA	NA	NA	N
Culex fuscanus	N	N	N	N	N	N	N	NA	N	NA	NA	N	P	N	N	N	NA	N	N	NA	NA	NA	NA	N
Culex fuscocephalus	N	N	N	N	N	N	N	NA	N	NA	NA	N	P	P	P	N	NA	P	P	NA	NA	NA	NA	N
Culex gelidus	N	N	N	N	N	N	N	NA	P	NA	NA	P	P	P	N	N	NA	P	P	NA	NA	NA	NA	N
Culex (Lophoceraomyia) rubithoracis	N	N	N	N	N	N	N	NA	N	NA	NA	N	N	N	N	N	NA	P	N	NA	NA	NA	NA	N
Culex pipiens quinquefasciatus	N	N	N	N	N	N	N	NA	N	NA	NA	P	P	P	N	P	NA	P	N	NA	NA	NA	NA	N
Culex sinensis	N	N	N	N	N	N	N	NA	N	NA	NA	N	N	N	N	N	NA	N	P	NA	NA	NA	NA	N
Culex tritaeniorhynchus	N	N	N	N	N	N	N	NA	P	NA	NA	P	P	P	P	P	NA	P	P	NA	NA	NA	NA	N
Culex whitmorei	N	N	N	N	N	N	N	NA	N	NA	NA	N	N	P	P	N	NA	N	N	NA	NA	NA	NA	N
Ficalbia hybrida	N	N	N	N	N	N	N	NA	P	NA	NA	N	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Ficalbia luzonensis	N	N	N	N	N	N	N	NA	N	NA	NA	N	N	N	N	P	NA	N	N	NA	NA	NA	NA	N
Mansonia crassipes	N	N	N	N	N	N	N	NA	N	NA	NA	P	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Mansonia ochracea	N	N	N	N	N	N	N	NA	N	NA	NA	P	N	N	N	N	NA	N	N	NA	NA	NA	NA	N
Mansonia uniformis	N	N	N	N	N	N	N	NA	P	NA	NA	P	P	P	N	N	NA	P	P	NA	NA	NA	NA	N

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – B

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

BINH THUY, VIETNAM

	MONTHS																								
	1966							1967														1968			
SPECIES	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes dux	NA	NA	NA	NA	NA	NA	NA	N	N	N	N	N	NA	P	P	NA	P	NA	N	N	NA	NA	NA	N
Aedes lineatopennis	NA	NA	NA	NA	NA	NA	NA	N	N	N	P	P	NA	P	N	NA	N	NA	N	N	NA	NA	NA	N
Aedes niveoscutellum	NA	NA	NA	NA	NA	NA	NA	N	N	N	N	N	NA	P	N	NA	N	NA	N	N	NA	NA	NA	N
Aedes poicilius	NA	NA	NA	NA	NA	NA	NA	N	N	N	P	N	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Aedeomyia catasticta	N	N	N	N	N	N	N	N	N	N	P	N	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Anopheles aconitus	N	N	N	N	N	N	N	N	N	P	N	N	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Anopheles argyropus	N	N	N	N	N	N	N	N	N	N	P	P	NA	N	P	NA	P	NA	P	P	NA	NA	NA	N
Anopheles barbirostris	N	N	N	N	N	N	N	P	N	N	N	P	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Anopheles campestris	N	N	N	N	N	N	N	P	N	N	N	P	NA	N	N	NA	N	NA	P	P	NA	NA	NA	N
Anopheles crawfordi	N	N	N	N	N	N	N	N	N	N	P	P	NA	P	P	NA	P	NA	P	P	NA	NA	NA	N
Anopheles indiensis	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	N	NA	N	NA	N	P	NA	NA	NA	N
Anopheles lesteri	N	N	N	N	N	N	N	N	N	N	P	P	NA	P	P	NA	P	NA	N	N	NA	NA	NA	N
Anopheles minimus	N	N	N	N	N	N	N	N	N	P	N	N	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Anopheles nigerrimus	N	N	N	N	N	N	N	N	N	N	P	N	NA	N	P	NA	N	NA	N	P	NA	NA	NA	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	P	N	N	P	P	NA	N	P	NA	N	NA	P	P	NA	NA	NA	N
Anopheles sinensis	N	N	N	N	N	N	N	P	N	P	P	P	NA	P	P	NA	P	NA	P	P	NA	NA	NA	N
Anopheles subpictus	N	N	N	N	N	N	N	P	N	N	N	N	NA	N	N	NA	N	NA	N	P	NA	NA	NA	N
Anopheles tessellatus	N	N	N	N	N	N	N	N	N	N	P	N	NA	P	N	NA	N	NA	N	N	NA	NA	NA	N
Anopheles umbrosus	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	N	NA	N	NA	P	P	NA	NA	NA	N
Anopheles vagus	N	N	N	N	N	N	N	N	N	N	P	N	NA	P	N	NA	N	NA	N	N	NA	NA	NA	N
Culex annulus	N	N	N	N	N	N	N	N	N	P	N	N	NA	P	P	NA	P	NA	P	P	NA	NA	NA	N
Culex bitaeniorhynchus	N	N	N	N	N	N	N	N	N	N	P	P	NA	P	P	NA	P	NA	N	N	NA	NA	NA	N
Culex brevipalpis	N	N	N	N	N	N	N	N	N	P	N	N	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Culex fuscanus	N	N	N	N	N	N	N	N	N	N	P	N	NA	N	P	NA	N	NA	N	N	NA	NA	NA	N
Culex fuscocephalus	N	N	N	N	N	N	N	N	N	P	P	P	NA	P	N	NA	N	NA	N	N	NA	NA	NA	N
Culex gelidus	N	N	N	N	N	N	N	P	N	P	P	P	NA	P	P	NA	P	NA	P	P	NA	NA	NA	N
Culex (Lophoceraomyia) pholeter	N	N	N	N	N	N	N	N	N	N	N	N	NA	P	P	NA	N	NA	N	N	NA	NA	NA	N

Culex nigropunctatus	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	N	NA	N	NA	P	P	NA	NA	NA	N
Culex pseudovishnui	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	N	NA	P	NA	N	N	NA	NA	NA	N
Culex pipiens quinquefasciatus	N	N	N	N	N	N	N	N	P	N	P	N	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Culex raptor	N	N	N	N	N	N	N	N	N	N	N	N	NA	P	N	NA	N	NA	N	N	NA	NA	NA	N
Culex sinensis	N	N	N	N	N	N	N	N	P	N	N	N	NA	N	N	NA	N	NA	P	P	NA	NA	NA	N
Culex tritaeniorhynchus	N	N	N	N	N	N	N	P	N	P	P	P	NA	P	P	NA	P	NA	P	P	NA	NA	NA	N
Ficalbia chamberlaini	N	N	N	N	N	N	N	N	N	P	P	N	NA	N	P	NA	N	NA	N	N	NA	NA	NA	N
Ficalbia hybrida	N	N	N	N	N	N	N	N	N	N	P	N	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Ficalbia luzonensis	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	N	NA	P	NA	N	N	NA	NA	NA	N
Ficalbia minima	N	N	N	N	N	N	N	N	N	N	N	P	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Hodgesia malayi	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	N	NA	N	NA	P	P	NA	NA	NA	N
Mansonia annulifera	N	N	N	N	N	N	N	N	N	N	N	P	NA	N	N	NA	N	NA	N	N	NA	NA	NA	N
Mansonia crassipes	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	P	NA	N	NA	N	N	NA	NA	NA	N
Mansonia nigrosignata	N	N	N	N	N	N	N	N	N	N	N	N	NA	P	N	NA	N	NA	N	N	NA	NA	NA	N
Mansonia ochracea	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	P	NA	N	NA	N	P	NA	NA	NA	N
Mansonia uniformis	N	N	N	N	N	N	N	P	N	P	P	P	NA	P	P	NA	P	NA	P	P	NA	NA	NA	N
Uranotaenia annandalei	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	P	NA	N	NA	N	N	NA	NA	NA	N
Uranotaenia campestris	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	P	NA	N	NA	N	N	NA	NA	NA	N
Uranotaenia maxima	N	N	N	N	N	N	N	N	N	N	N	N	NA	N	P	NA	N	NA	N	N	NA	NA	NA	N
Uranotaenia obscura	N	N	N	N	N	N	N	N	N	P	N	N	NA	N	N	NA	N	NA	N	N	NA	NA	N	N

P = Species collected

N = Species not collected

NA = No collections attempted

TABLE III – C

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

CAM RANH BAY, VIETNAM

SPECIES	MONTHS																								
	1966							1967											1968						
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes albolineatus	NA	NA	NA	NA	N	NA	N	N	N	NA	N	N	P	NA	N	NA	N	N	N	N	NA	NA	N	N
Aedes albopictus	NA	NA	NA	NA	N	NA	P	N	N	NA	N	P	P	NA	N	NA	N	N	N	N	NA	NA	N	N
Aedes imprimens	NA	NA	NA	NA	N	NA	N	N	N	NA	N	N	P	NA	N	NA	N	N	N	N	NA	NA	N	N
Aedes pseudoalbopictus	NA	NA	NA	NA	N	NA	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	N	N
Aedes vexans	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	P	P	N	N	NA	NA	N	N
Aedeomyia catasticta	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	N	P	N	NA	NA	N	N
Anopheles crawfordi	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	N	P	N	NA	NA	N	N
Anopheles karwari	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	P	N
Anopheles lesteri	N	N	N	N	P	N	N	N	N	NA	N	N	N	NA	N	NA	N	N	N	N	NA	NA	N	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	N	N
Anopheles sinensis	N	N	N	N	N	N	N	P	P	NA	N	N	N	NA	N	NA	N	N	N	N	NA	NA	N	N
Anopheles subpictus	N	N	N	N	N	N	N	N	N	NA	P	N	N	NA	N	NA	N	P	N	N	NA	NA	N	N
Culex annulus	N	N	N	N	P	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	P	N	NA	NA	N	N
Culex bitaeniorhynchus	N	N	N	N	P	N	P	N	N	NA	N	P	P	NA	P	NA	N	N	P	P	NA	NA	N	N
Culex fuscanus	N	N	N	N	P	N	P	N	N	NA	N	P	N	NA	N	NA	N	P	P	P	NA	NA	N	N
Culex fuscocephalus	N	N	N	N	N	N	N	N	N	NA	N	P	N	NA	N	NA	N	N	P	P	NA	NA	N	P
Culex gelidus	N	N	N	N	P	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	P	N	NA	NA	N	P
Culex mimeticus	N	N	N	N	P	N	N	N	N	NA	N	N	N	NA	N	NA	N	N	N	N	NA	NA	N	N
Culex pseudosinensis	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	N	N
Culex pseudovishnui	N	N	N	N	N	N	N	P	N	NA	N	N	N	NA	N	NA	N	N	N	N	NA	NA	P	N
Culex quadripalpis	N	N	N	N	P	N	N	N	N	NA	N	N	N	NA	N	NA	N	N	N	N	NA	NA	N	N
Culex pipiens quinquefasciatus	N	N	N	N	N	N	P	P	N	NA	N	P	N	NA	N	NA	P	P	P	P	NA	NA	P	N
Culex tritaeniorhynchus	N	N	N	N	N	N	N	N	N	NA	N	P	N	NA	N	NA	P	P	P	P	NA	NA	N	N
Culex whitei	N	N	N	N	N	N	N	N	N	NA	N	P	N	NA	N	NA	N	N	N	N	NA	NA	N	N
Ficalbia chamberlaini	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	N	N
Ficalbia luzonensis	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	N	N
Mansonia crassipes	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	N	N
Mansonia ochracea	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	N	P	N	N	NA	NA	P	N
Mansonia uniformis	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	P	P	P	N	NA	NA	N	N
Toxorhynchites splendens	N	N	N	N	P	N	N	N	N	NA	N	N	N	NA	N	NA	N	N	N	N	NA	NA	N	N
Tripteroides aranoides	N	N	N	N	N	N	N	N	N	NA	N	N	N	NA	N	NA	P	P	N	N	NA	NA	N	N

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – D

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

DA NANG, VIETNAM

SPECIES	MONTHS																								
	1966							1967												1968				
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Anopheles aconitus	N	N	N	N	N	N	N	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Anopheles sinensis	N	N	N	N	N	N	N	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Anopheles vagus	N	N	N	N	N	N	N	NA	NA	NA	NA	P	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Culex annulus	N	N	N	N	N	N	N	NA	NA	NA	NA	P	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Culex bitaeniorhynchus	N	N	N	N	N	N	N	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Culex fuscocephalus	N	N	N	N	N	N	N	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Culex gelidus	N	N	N	N	N	N	N	NA	NA	NA	NA	P	NA	NA	NA	NA	NA	NA	P	NA	P	NA	N	N
Culex (Lophoceraomyia) rubithoracis	N	N	N	N	N	N	N	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Culex pseudovishnui	N	N	N	N	N	N	N	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	N	N
Culex pipiens quinquefasciatus	N	N	N	N	N	N	N	NA	NA	NA	NA	P	NA	NA	NA	NA	NA	NA	P	NA	P	NA	N	N
Culex tritaeniorhynchus	N	N	N	N	N	N	N	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	N	N

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – E

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

NHA TRANG, VIETNAM

SPECIES	MONTHS																									
	1966							1967														1968				
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes chrysolineatus	NA	NA	NA	NA	NA	NA	NA	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N
Aedes dux	NA	NA	NA	NA	NA	NA	NA	N	N	N	N	N	N	P	N	P	P	P	N	N	N	N	N	N	N
Aedes gubernatoris	NA	NA	NA	NA	NA	NA	NA	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Aedes lineatopennis	NA	NA	NA	NA	NA	NA	NA	N	N	N	N	N	N	N	N	N	P	P	P	N	N	N	N	N	N
Aedes pseudoalbopictus	NA	NA	NA	NA	NA	NA	NA	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Aedes vexans	N	N	N	N	N	N	N	N	P	N	N	N	N	P	N	P	P	P	N	P	N	P	N	N	N
Aedes vigilax	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	P	P	P	N	N	N	N	N	N	N
Anopheles aconitus	N	N	N	N	N	N	N	N	N	P	P	N	P	P	N	P	N	P	N	N	P	N	N	N	N
Anopheles annularis	N	N	N	N	N	N	N	N	N	N	N	N	N	P	N	P	P	P	P	P	P	N	N	N	N
Anopheles argyropus	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N
Anopheles crawfordi	N	N	N	N	N	N	N	N	N	N	P	P	P	P	N	N	P	P	N	N	N	N	N	N	N
Anopheles lesteri	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N
Anopheles minimus	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Anopheles nigerrimus	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	N	N	N	N	P	N	P	N	P	P	P	N	N	N	N	N	N	N
Anopheles philippinensis	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	P	P	N	N	P	N	N	N	N	N
Anopheles sinensis	N	N	N	N	N	N	N	P	P	P	P	P	P	P	N	P	P	P	P	N	N	P	N	N	N
Anopheles subpictus	N	N	N	N	N	N	N	P	N	P	P	P	P	P	P	P	P	P	P	P	P	P	N	N	N
Anopheles tessellatus	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	P	P	N	N	N	N	N	N	N
Anopheles vagus	N	N	N	N	N	N	N	P	P	P	P	P	P	P	P	P	N	P	P	P	P	P	N	N	N
Culex annulus	N	N	N	N	N	N	N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	N	N	N
Culex bitaeniorhynchus	N	N	N	N	N	N	N	P	P	P	P	P	N	P	P	N	N	P	P	P	N	N	N	N	N
Culex brevipalpis	N	N	N	N	N	N	N	N	N	N	P	P	N	N	N	N	P	P	P	P	P	N	N	N	N
Culex fuscocephalus	N	N	N	N	N	N	N	P	P	N	N	N	P	P	P	P	P	P	P	P	P	P	N	N	N
Culex gelidus	N	N	N	N	N	N	N	P	P	P	P	P	P	P	N	P	P	P	P	P	P	P	N	N	N
Culex khazani	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Culex (Lophoceraomyia) pholeter	N	N	N	N	N	N	N	N	N	P	N	N	N	P	N	P	N	P	N	N	N	N	N	N	N

Culex nigropunctatus	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N
Culex pseudosinensis	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N
Culex pseudovishnui	N	N	N	N	N	N	N	N	N	N	N	N	P	P	N	P	P	P	P	N	N	N	N	N	N
Culex pipiens quinquefasciatus	N	N	N	N	N	N	N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	N	N	N
Culex sinensis	N	N	N	N	N	N	N	P	N	N	N	P	N	N	N	N	N	P	P	N	N	N	N	N	N
Culex sitiens	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	P	N	N	N	N	N	N
Culex tritaeniorhynchus	N	N	N	N	N	N	N	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	N	N	N
Culex whitei	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	'	N	N	N	N	N	N	N
Culex whitmorei	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	P	P	P	P	N	N	N	N	N
Ficalbia chamberlaini	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N
Ficalbia luzonensis	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N
Malaya jacobsoni	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N
Mansonia crassipes	N	N	N	N	N	N	N	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Mansonia uniformis	N	N	N	N	N	N	N	N	P	P	P	P	P	P	N	P	P	N	N	N	N	N	N	N	N
Uranotaenia annandalei	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	P	P	N	N	N	N	N	N	N
Uranotaenia campestris	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Uranotaenia macfarlanei	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – F

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

PHAN RANG, VIETNAM

SPECIES	MONTHS																								
	1966							1967														1968			
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes albopictus	NA	P	NA	NA	NA	NA	NA	N	NA	NA	NA	N	N	N	N	N	N	N	N	N	NA	NA	N	N
Aedes albosculellatus	NA	N	NA	NA	NA	NA	NA	N	NA	NA	NA	N	N	P	N	N	N	N	N	N	NA	NA	N	N
Aedes dux	NA	N	NA	NA	NA	NA	NA	N	NA	NA	NA	N	P	P	P	N	N	N	P	P	NA	NA	N	N
Aedes lineatopennis	NA	N	NA	NA	NA	NA	NA	N	NA	NA	NA	N	N	P	P	P	P	P	P	N	NA	NA	N	N
Aedes mediolineatus	NA	N	NA	NA	NA	NA	NA	N	NA	NA	NA	N	N	N	P	N	N	N	N	N	NA	NA	N	N
Aedes niveoscutellum	NA	N	NA	NA	NA	NA	NA	N	NA	NA	NA	N	P	N	N	N	N	N	N	N	NA	NA	N	N
Aedes pseudoalbopictus	NA	N	NA	NA	NA	NA	NA	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Aedes taeniorhynchoides	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	P	N	N	N	N	N	N	NA	NA	NA	N
Aedes vexans	N	P	N	N	N	N	N	N	NA	NA	NA	N	P	N	P	P	P	P	P	N	NA	NA	N	N
Aedes vigilax	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	P	NA	NA	N	N
Aedeomyia catasticta	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	N	P	N	NA	NA	N	N
Anopheles aconitus	N	N	N	N	N	N	N	N	NA	NA	NA	N	P	P	P	P	P	P	P	N	NA	NA	N	N
Anopheles annularis	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	P	P	P	P	P	NA	NA	N	N
Anopheles argyropus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Anopheles crawfordi	N	N	N	N	N	N	N	N	NA	NA	NA	P	P	P	P	P	N	P	P	P	NA	NA	N	N
Anopheles indiensis	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	P	P	N	N	N	N	NA	NA	N	N
Anopheles lesteri	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Anopheles minimus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	N	N	P	NA	NA	N	N
Anopheles nigerrimus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	N	P	N	NA	NA	N	N
Anopheles pallidus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	P	N	N	P	NA	NA	N	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	P	P	P	P	P	N	NA	NA	N	N
Anopheles philippinensis	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	P	N	N	P	NA	NA	N	N
Anopheles sinensis	N	N	N	N	N	N	N	N	NA	NA	NA	N	P	P	P	P	P	P	P	P	NA	NA	N	N
Anopheles subpictus	N	P	N	N	N	N	N	N	NA	NA	NA	N	P	P	P	N	P	N	P	N	NA	NA	N	N
Anopheles tessellatus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Anopheles vagus	N	N	N	N	N	N	N	N	NA	NA	NA	N	P	P	P	P	N	P	N	N	NA	NA	N	N
Culex annulus	N	P	N	N	N	N	N	N	NA	NA	NA	N	P	P	P	P	P	P	P	P	NA	NA	N	N

Culex bitaeniorhynchus	N	P	N	N	N	N	N	N	NA	NA	NA	N	N	P	P	N	P	N	N	N	NA	NA	N	N
Culex fuscanus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	P	N	N	P	N	P	N	NA	NA	N	N
Culex fuscocephalus	N	N	N	N	N	N	N	N	NA	NA	NA	N	P	P	P	P	P	P	P	P	NA	NA	N	N
Culex gelidus	N	P	N	N	N	N	N	N	NA	NA	NA	N	N	P	P	P	P	P	P	N	NA	NA	N	N
Culex khazani	N	N	N	N	N	N	N	N	NA	NA	NA	P	N	N	N	N	N	N	N	N	NA	NA	N	N
Culex (Lophoceraomyia) minor	N	P	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	N	N	N	NA	NA	N	N
Culex (Lophoceraomyia) pholeter	N	N	N	N	N	N	N	N	NA	NA	NA	N	P	N	P	N	N	N	N	N	NA	NA	N	N
Culex (Lophoceraomyia) reidi	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Culex (Lophoceraomyia) rubithoracis	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	P	N	N	N	NA	NA	N	N
Culex nigropunctatus	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	P	N	P	NA	NA	N	N
Culex pseudosinensis	N	N	N	N	N	N	N	N	NA	NA	NA	P	N	N	N	N	N	P	N	N	NA	NA	N	N
Culex pseudovishnui	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	P	N	N	N	N	P	NA	NA	N	N
Culex pipiens quinquefasciatus	N	P	N	N	N	N	N	P	NA	NA	NA	N	N	N	P	N	P	P	P	N	NA	NA	N	N
Culex sitiens	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Culex tritaeniorhynchus	N	P	N	N	N	N	N	N	NA	NA	NA	P	P	P	P	P	P	P	P	P	NA	NA	N	N
Culex whitmorei	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	P	P	P	P	N	NA	NA	N	N
Mansonia crassipes	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Mansonia ochracea	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	P	N	N	N	NA	NA	N	N
Mansonia uniformis	N	P	N	N	N	N	N	N	NA	NA	NA	N	N	P	N	P	N	P	N	N	NA	NA	N	N
Uranotaenia maxima	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	N	P	N	NA	NA	N	N
Uranotaenia obscura	N	N	N	N	N	N	N	N	NA	NA	NA	N	N	N	N	N	N	P	N	N	NA	NA	N	N
Uranotaenia recondita	N	N	N	N	N	N	N	N	NA	NA	NA	N	P	N	N	N	N	N	N	N	NA	NA	N	N

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – G

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

PLEIKU A. B. VIETNAM

SPECIES	MONTHS																								
	1966							1967														1968			
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes albopictus	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	N	N	N	P	N	N	N	N	N	N	P	N
Aedes gubernatoris	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	N	N	N	N	N	P	N	N	N	N	N	N
Aedes laniger	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	N	N	P	P	P	N	N	N	N	N	N	N
Aedes lineatopennis	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	N	P	P	P	P	P	P	N	N	P	N	N
Aedes mediolineatus	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	N	N	P	P	N	N	N	N	N	N	N	N
Aedes niveoscutellum	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	N	N	N	P	N	N	N	N	N	N	N	N
Aedes ostentatio	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	P	N	N	N	N	N	N	N	N	N	N	N
Aedes pseudoalbopictus	NA	NA	NA	N	NA	NA	NA	NA	NA	N	NA	N	N	N	N	N	P	P	N	N	N	N	N	N
Aedes vexans	N	N	N	P	N	N	N	NA	NA	N	NA	P	N	P	P	P	N	N	N	N	P	N	P	N
Aedes vittatus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	P	N	N	N	N	N	N	N
Aedeomyia catasticta	N	N	N	N	N	N	N	NA	NA	N	NA	P	N	N	P	N	P	P	N	N	N	N	P	N
Anopheles aconitus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	P	N	P	N	N	N	N	N
Anopheles annularis	N	N	N	N	N	N	N	NA	NA	N	NA	N	P	P	P	P	P	P	P	P	P	N	N	N
Anopheles argyropus	N	N	N	N	N	N	N	NA	NA	N	NA	P	N	N	N	N	P	P	P	P	P	P	P	P
Anopheles crawfordi	N	N	N	N	N	N	N	NA	NA	N	NA	P	N	P	P	P	P	P	P	N	P	N	N	N
Anopheles indiensis	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	P	N	N	P	N	N	N	N	N	N
Anopheles karwari	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	P	P	P	N	N	N	N	N	N
Anopheles lesteri	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	N	N	P	N	N	N	N	N
Anopheles maculatus	N	N	N	N	N	N	N	NA	NA	N	NA	P	N	N	P	P	P	P	P	N	P	N	N	N
Anopheles minimus	N	N	N	N	N	N	N	NA	NA	N	N	N	N	N	N	N	N	N	P	N	N	N	N	N
Anopheles nigerrimus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	N	N	N	N	P	P	N	N	N	N
Anopheles pallidus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	N	N	N	N	P	N	N	N	N	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	P	P	P	P	P	P	N	P	P	P
Anopheles philippinensis	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	P	N	P	P	P	N	N	N	N	N
Anopheles sinensis	N	N	N	P	N	N	N	NA	NA	N	NA	N	P	P	P	P	P	P	P	P	P	P	P	P
Anopheles splendidus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	N	N	N	N	N	N	N	P	N	N
Anopheles subpictus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	N	P	P	P	P	N	N	N	N	N

Anopheles vagus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	N	N	P	P	N	N	N	N	N	N	N
Armigeres flavus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	P	N	N	P	N	N	N	N	N	N
Armigeres subalbatus	N	N	N	N	N	N	N	NA	NA	N	NA	N	P	N	P	P	P	N	N	N	N	N	N	N	N
Culex annulus	N	N	N	N	N	N	N	NA	NA	N	NA	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Culex bitaeniorhynchus	N	N	N	N	N	N	N	NA	NA	N	NA	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Culex brevipalpis	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	N	P	P	N	N	N	N	N	N
Culex fuscanus	N	N	N	P	N	N	N	NA	NA	N	NA	N	N	P	P	P	P	P	P	N	P	P	P	N	N
Culex fuscocephalus	N	N	N	N	N	N	N	NA	NA	N	NA	N	P	P	P	P	P	P	P	P	P	P	P	P	P
Culex gelidus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	P	P	P	P	P	P	N	N	N	P	P
Culex (Lophoceraomyia) pholeter	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	P	N	P	N	N	N	N	N	N	N	N	N
Culex nigropunctatus	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	P	P	P	P	N	P	N	N	N	P	P
Culex pseudosinensis	N	N	N	N	N	N	N	NA	NA	NA	NA	N	N	N	N	P	P	P	P	P	P	N	P	P	P
Culex pseudovishnui	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	P	P	P	P	P	N	P	N	P	P	N
Culex pipiens quinquefasciatus	N	N	N	P	N	N	N	NA	NA	N	NA	P	P	P	N	P	N	P	P	P	P	P	P	P	P
Culex sinensis	N	N	N	N	N	N	N	NA	NA	N	NA	N	P	N	N	N	N	N	P	N	N	N	N	P	P
Culex sitiens	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	N	N	N	N	N	N	N	N	P
Culex tritaeniorhynchus	N	N	N	P	N	N	N	NA	NA	N	NA	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Culex whitei	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	N	P	N	N	N	N	N	N	N
Culex whitmorei	N	N	N	N	N	N	N	NA	NA	N	NA	P	P	P	P	P	P	P	P	P	P	N	N	N	N
Ficalbia chamberlaini	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	N	N	P	N	N	N	N	N	N
Hodgesia malayi	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Mansonia crassipes	N	N	N	N	N	N	N	NA	NA	NA	NA	N	N	N	P	N	N	P	N	N	N	N	N	N	N
Mansonia uniformis	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	P	P	P	P	P	P	P	N	N	N	N
Uranotaenia annandalei	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	P	N	P	P	N	N	N	N	N
Uranotaenia macfarlanei	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	N	N	N.	N	P	N	N	N	N	N	N
Uranotaenia maxima	N	N	N	N	N	N	N	NA	NA	N	NA	N	N	N	P	N	P	N	N	N	N	N	N	N	N

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – H

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

PHU CAT, VIETNAM

SPECIES	MONTHS																								
	1966							1967														1968				
	JU. E	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes aegypti	NA	NA	NA	NA	NA	NA	NA	NA	N	P	NA	N	N	N	N	NA	NA	N	N	N	N	N	N	N
Aedes amesi	NA	NA	NA	NA	NA	NA	NA	NA	N	N	NA	N	N	P	N	NA	NA	N	N	N	N	N	N	N
Aedes lineatopennis	NA	NA	NA	NA	NA	NA	NA	NA	N	N	NA	N	N	N	P	NA	NA	N	N	N	N	N	N	N
Aedes longirostris	NA	NA	NA	NA	NA	NA	NA	NA	N	N	NA	N	P	N	P	NA	NA	N	N	N	N	N	N	N
Aedes mediolineatus	NA	NA	NA	NA	NA	NA	NA	NA	N	N	NA	N	N	N	P	NA	NA	N	N	N	N	N	N	N
Aedes ostentatic	NA	NA	NA	NA	NA	NA	NA	NA	N	N	NA	N	N	N	N	NA	NA	P	N	N	N	N	N	N
Aedes poicilius	NA	NA	NA	NA	NA	NA	NA	NA	N	P	NA	P	N	N	N	NA	NA	N	N	N	N	N	N	N
Aedes vexans	N	N	N	N	N	N	N	NA	N	N	NA	N	N	P	P	NA	NA	N	N	N	N	P	N	N
Aedes vittatus	N	N	N	N	N	N	N	NA	N	N	NA	N	N	P	N	NA	NA	N	N	N	N	N	N	N
Aedeomyia catasticta	N	N	N	N	N	N	N	NA	N	N	NA	N	P	N	P	NA	NA	N	N	N	N	P	N	N
Anopheles aconitus	N	N	N	N	N	N	N	NA	P	P	NA	P	P	P	P	NA	NA	N	P	F	P	P	N	N
Anopheles annandalei interruptus	N	N	N	N	N	N	N	NA	N	N	NA	N	P	N	N	NA	NA	N	N	N	N	N	N	N
Anopheles annularis	N	N	N	N	N	N	N	NA	P	P	NA	P	P	P	N	NA	NA	P	P	N	P	P	N	N
Anopheles argyropus	N	N	N	N	N	N	N	NA	N	N	NA	P	N	N	N	NA	NA	P	N	N	N	N	N	N
Anopheles barbirostris	N	N	N	N	N	N	N	NA	N	N	NA	N	N	N	N	NA	NA	N	N	N	P	N	N	N
Anopheles campestris	N	N	N	N	N	N	N	NA	N	N	NA	N	N	N	N	NA	NA	N	N	P	N	N	N	N
Anopheles crawfordi	N	N	N	N	N	N	N	NA	N	P	NA	P	P	P	P	NA	NA	P	N	P	P	P	N	N
Anopheles indiensis	N	N	N	N	N	N	N	NA	N	N	NA	P	P	N	N	NA	NA	P	N	N	N	N	N	N
Anopheles jeyporiensis candidiensis	N	N	N	N	N	N	N	NA	P	N	NA	N	N	N	N	NA	NA	N	N	N	N	N	N	N
Anopheles karwari	N	N	N	N	N	N	N	NA	P	N	NA	P	N	N	N	NA	NA	N	P	N	N	N	N	N
Anopheles lesteri	N	N	N	N	N	N	N	NA	P	N	NA	N	N	N	N	NA	NA	N	P	N	N	N	N	N
Anopheles minimus	N	N	N	N	N	N	N	NA	N	P	NA	N	P	N	N	NA	NA	N	N	N	N	N	N	N
Anopheles nigerrimus	N	N	N	N	N	N	N	NA	N	P	NA	P	P	P	N	NA	NA	P	P	P	P	P	N	N
Anopheles pallidus	N	N	N	N	N	N	N	NA	N	N	NA	N	N	P	N	NA	NA	P	N	N	P	N	N	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	NA	N	P	NA	P	P	P	P	NA	NA	P	P	N	P	P	N	N
Anopheles philippinensis	N	N	N	N	N	N	N	NA	N	N	NA	N	N	N	N	NA	NA	P	N	N	P	P	N	N
Anopheles sinensis	N	N	N	N	N	N	N	NA	P	P	NA	P	P	P	P	NA	NA	P	P	P	P	P	N	N
Anopheles subpictus	N	N	N	N	N	N	N	NA	N	P	NA	P	P	N	P	NA	NA	P	N	P	P	P	N	N
Anopheles tessellatus	N	N	N	N	N	N	N	NA	N	N	NA	P	N	N	N	NA	NA	N	N	N	N	N	N	N

Anopheles umbrosus	N	N	N	N	N	N	N	NA	P	N	NA	N	N	N	N	NA	NA	N	N	N	N	N	N	N	N
Anopheles vagus	N	N	N	N	N	N	N	NA	P	P	NA	P	N	P	P	NA	NA	P	P	N	P	P	N	N	
Anopheles varuna	N	N	N	N	N	N	N	NA	P	N	NA	N	N	N	N	NA	NA	N	N	N	N	N	N	N	
Armigeres subalbatus	N	N	N	N	N	N	N	NA	N	N	NA	N	N	N	P	NA	NA	N	N	N	N	N	N	N	
Culex annulus	N	N	N	N	N	N	N	NA	P	P	NA	P	P	P	P	NA	NA	P	P	P	P	P	N	N	
Culex bitaeniorhynchus	N	N	N	N	N	N	N	NA	P	P	NA	P	P	P	P	NA	NA	P	N	P	P	P	N	N	
Culex brevipalpis	N	N	N	N	N	N	N	NA	N	P	NA	N	N	N	N	NA	NA	N	N	N	N	N	N	N	
Culex fuscanus	N	N	N	N	N	N	N	NA	N	P	NA	P	N	N	N	NA	NA	P	P	P	P	N	N	N	
Culex fuscocephalus	N	N	N	N	N	N	N	NA	N	N	NA	P	P	P	P	NA	NA	P	P	P	P	N	N	N	
Culex gelidus	N	N	N	N	N	N	N	NA	P	P	NA	P	P	P	P	NA	NA	P	P	P	P	N	N	N	
Culex khazani	N	N	N	N	N	N	N	NA	N	N	NA	P	N	N	N	NA	NA	N	N	N	N	N	N	N	
Culex (Lophoceraomyia) incomptus	N	N	N	N	N	N	N	NA	N	N	NA	P	N	N	N	NA	NA	N	N	N	N	N	N	N	
Culex (Lophoceraomyia) peytoni	N	N	N	N	N	N	N	NA	N	N	NA	P	N	N	N	NA	NA	N	N	N	N	N	N	N	
Culex (Lophoceraomyia) pholeter	N	N	N	N	N	N	N	NA	N	N	NA	P	P	N	N	NA	NA	N	N	N	N	P	N	N	
Culex pseudosinensis	N	N	N	N	N	N	N	NA	N	N	NA	P	N	N	N	NA	NA	P	P	P	P	P	N	N	
Culex pseudovishnui	N	N	N	N	N	N	N	NA	N	N	NA	N	P	N	N	NA	NA	P	P	P	P	P	N	N	
Culex pipiens quinquefasciatus	N	N	N	N	N	N	N	NA	P	P	NA	P	P	N	P	NA	NA	P	N	P	P	P	N	N	
Culex sinensis	N	N	N	N	N	N	N	NA	N	P	NA	N	N	N	N	NA	NA	N	N	N	P	N	N	N	
Culex tritaeniorhynchus	N	N	N	N	N	N	N	NA	P	P	NA	P	P	P	P	NA	NA	P	P	P	P	P	N	N	
Culex whitmorei	N	N	N	N	N	N	N	NA	N	P	NA	P	P	P	P	NA	NA	P	P	P	P	P	N	N	
Ficalbia chamberlaini	N	N	N	N	N	N	N	NA	P	N	NA	P	P	P	N	NA	NA	N	N	P	P	P	N	N	
Ficalbia luzonensis	N	N	N	N	N	N	N	NA	N	N	NA	N	N	N	N	NA	NA	N	N	P	N	P	N	N	
Ficalbia minima	N	N	N	N	N	N	N	NA	N	N	NA	P	N	N	N	NA	NA	N	N	N	N	N	N	N	
Mansonia crassipes	N	N	N	N	N	N	N	NA	N	N	NA	P	P	N	P	NA	NA	N	N	N	N	N	N	N	
Mansonia uniformis	N	N	N	N	N	N	N	NA	N	P	NA	P	P	P	P	NA	NA	P	P	P	P	N	N	N	
Uranotaenia campestris	N	N	N	N	N	N	N	NA	N	P	NA	P	N	N	N	NA	NA	N	N	N	N	N	N	N	
Uranotaenia maxima	N	N	N	N	N	N	N	NA	N	N	NA	N	N	N	N	NA	NA	N	N	N	P	N	N	N	
Uranotaenia obscura	N	N	N	N	N	N	N	NA	N	N	NA	N	N	N	N	NA	NA	N	N	N	N	P	N	N	

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – I

OCCURRENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

TAN SON NHUT, VIETNAM

SPECIES	MONTHS																							
	1966							1967											1968					
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes aegypti	NA	P	N	P	N	N	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Aedes dux	NA	N	N	N	N	N	N	N	NA	N	NA	N	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Aedes vexans	N	N	N	N	N	N	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Anopheles aconitus	N	N	N	N	N	N	N	N	NA	N	NA	N	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Anopheles annularis	N	P	N	P	N	N	N	N	NA	N	NA	N	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Anopheles crawfordi	N	N	N	N	N	N	N	N	NA	N	NA	N	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Anopheles philippinensis	N	P	N	N	N	N	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Anopheles sinensis	N	N	N	P	N	P	N	N	NA	N	NA	N	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Anopheles subpictus	N	N	P	P	N	N	N	P	NA	N	NA	N	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Anopheles tessellatus	N	N	N	N	N	N	N	N	NA	N	NA	P	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Anopheles vagus	N	P	P	N	P	N	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Culex annulioris	N	N	N	P	N	P	N	N	NA	N	NA	P	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Culex brevipalpis	N	N	N	N	P	P	N	P	NA	N	NA	P	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Culex fuscanus	N	N	P	N	P	N	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Culex fuscocephalus	N	N	P	N	N	N	N	P	NA	P	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Culex gelidus	N	N	N	P	N	P	N	P	NA	P	NA	P	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Culex pipiens quinquefasciatus	N	P	P	P	N	P	P	P	NA	P	NA	P	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Culex raptor	N	N	N	N	P	N	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Culex sinensis	N	N	N	N	N	P	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Culex tritaeniorhynchus	N	N	P	P	P	P	N	P	NA	P	NA	P	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	P
Culex whitmorei	N	N	N	N	N	P	N	N	NA	N	NA	N	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Ficalbia chamberlaini	N	N	N	N	N	N	N	N	NA	P	NA	N	P	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N
Malaya jacobsoni	N	N	N	N	N	N	N	N	NA	N	NA	P	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	N

P = Species collected N = Species not collected NA = No collections attempted

TABLE III – J

OCCURENCE OF MOSQUITO SPECIES BY MONTH OVER A 24-MONTH PERIOD BASED ON LIGHT TRAP AND LARVAL COLLECTIONS

TUY HOA, VIETNAM

SPECIES	MONTHS																							
	1966							1967												1968				
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY
Aedes dux	NA	NA	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Aedes lineatopeanis	NA	NA	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Aedes longirostris	NA	NA	NA	NA	NA	NA	N	P	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Aedes vexans	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Aedeomyia catasticta	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Anopheles annularis	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Anopheles crawfordi	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Anopheles peditaeniatus	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	N	NA	P	NA	NA	NA	NA	NA	NA	N	N
Anopheles sinensis	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Anopheles subpictus	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	N	NA	P	NA	NA	NA	NA	NA	NA	N	N
Anopheles vagus	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Culex annulus	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Culex bitaeniorhynchus	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Culex gelidus	N	N	N	N	N	N	P	NA	NA	NA	NA	NA	NA	N	NA	N	NA	NA	NA	NA	NA	NA	N	N
Culex pipiens quinquefasciatus	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Culex tritaeniorhynchus	N	N	N	N	N	N	P	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Culex whitmorei	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Mansonia crassipes	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Mansonia ochracea	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N
Mansonia uniformis	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	P	NA	NA	NA	NA	NA	NA	N	N
Tripteroides aranoides	N	N	N	N	N	N	N	NA	NA	NA	NA	NA	NA	P	NA	N	NA	NA	NA	NA	NA	NA	N	N

P = Species collected N = Species not collected NA = No collections attempted

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) USAF 5th Epidemiological Flight Aerospace Medical Division (AFSC) APO San Francisco 96528	2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED 2b. GROUP N/A

3. REPORT TITLE

THE OCCURRENCE AND KNOWN HUMAN DISEASE RELATIONSHIPS OF MOSQUITOES ON USAF INSTALLATIONS IN THE REPUBLIC OF VIETNAM.

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Final Report 1 June 1966 - 1 June 1968

5. AUTHOR(S) (Last name, first name, initial)

PARRISH, DALE W., Major, USAF, BSC

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
July 1968		2

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO. 6321	5EF -TR-68-1
c. Task No. 02	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) N/A
d.	

10. AVAILABILITY/LIMITATION NOTICES

Distribution of this document if unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
N/A	USAF 5th Epidemiological Flight Aerospace Medical Division (AFSC) APO San Francisco

13. ABSTRACT

Data ~~is~~ presented on the occurrence and human disease relationships of mosquitoes on USAF installations located in the Republic of Vietnam. Information contained in this report is based upon the identification of mosquito specimens submitted ~~to the~~ USAF 5th Epidemiological Flight by ~~USAF~~ Military Public Health personnel from 10 USAF installations in RVN over a 24-month period between 1 June 1966 and 1 June 1968.

Mosquito surveys were accomplished on a routine basis in connection with the objectives of the USAF Aerospace Medicine Program to prevent and control vector-borne diseasee.

A total of 94 different species of mosquitoes were identified from all collections. Of this number, 22 species or 23.4 percent, are known vectors of human disease.

DD FORM 1 JAN 64 1473

UNCLASSIFIED

Security Classification

(Reverse of Form DD 1473)

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Mosquito occurrence Disease-Vector surveillance and control Human disease relationships Mosquito-borne disease incidence Military Public Health Air Force Installations Republic of Vietnam						

INSTRUCTIONS

1. ORIGINATING ACTIVITY: Enter the name and address of the contractor, subcontractor, grantee, Department of Defense activity or other organization *(corporate author)* issuing the report.

2a. REPORT SECURITY CLASSIFICATION: Enter the overall security classification of the report. Indicate whether "Restricted Data" is included. Marking is to be in accordance with appropriate security regulations.

2b. GROUP: Automatic downgrading is specified in DoD Directive 5200.10 and Armed Forces Industrial Manual. Enter the group number. Also, when applicable, show that optional markings have been used for Group 3 and Group 4 as authorized.

3. REPORT TITLE: Enter the complete report title in all capital letters. Titles in all cases should be unclassified. If a meaningful title cannot be selected without classification, show title classification in all capitals in parenthesis immediately following the title.

4. DESCRIPTIVE NOTES: If appropriate, enter the type of report, e.g., interim, progress, summary, annual, or final. Give the inclusive dates when a specific reporting period is covered.

5. AUTHOR(S): Enter the name(s) of author(s) as shown on or in the report. Enter last name, first name, middle initial. If military, show rank and branch of service. The name of the principal author is an absolute minimum requirement.

6. REPORT DATE: Enter the date of the report as day, month, year; or month, year. If more than one date appears on the report, use date of publication.

7a. TOTAL NUMBER OF PAGES: The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.

7b. NUMBER OF REFERENCES: Enter the total number of references cited in the report.

8a. CONTRACT OR GRANT NUMBER: If appropriate, enter the applicable number of the contract or grant under which the report was written.

8b, 8c, & 8d. PROJECT NUMBER: Enter the appropriate military department identification, such as project number, subproject number, system numbers, task number, etc.

9a. ORIGINATOR'S REPORT NUMBER(S): Enter the official report number by which the document will be identified and controlled by the originating activity. This number must be unique to this report.

9b. OTHER REPORT NUMBER(S): If the report has been assigned any other report numbers *(either by the originator or by the sponsor)*, also enter this number(s).

10. AVAILABILITY/LIMITATION NOTICES: Enter any limitations on further dissemination of the report, other than those imposed by security classification, using standard statements such as:

(1) "Qualified requesters may obtain copies of this report from DDC."

(2) "Foreign announcement and dissemination of this report by DDC is not authorized."

(3) "U. S. Government agencies may obtain copies of this report directly from DDC. Other qualified DDC users shall request through _____."

(4) "U. S. military agencies may obtain copies of this report directly from DDC. Other qualified users shall request through _____."

(5) "All distribution of this report is controlled. Qualified DDC users shall request through _____."

If the report has been furnished to the Office of Technical Services, Department of Commerce, for sale to the public, indicate this fact and enter the price, if known.

11. SUPPLEMENTARY NOTES: Use for additional explanatory notes.

12. SPONSORING MILITARY ACTIVITY: Enter the name of the departmental project office or laboratory sponsoring *(paying for)* the research and development. Include address.

13. ABSTRACT: Enter an abstract giving a brief and factual summary of the document indicative of the report, even though it may also appear elsewhere in the body of the technical report. If additional space is required, a continuation sheet shall be attached.

It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as (TS), (S), (C), or (U).

There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.

14. KEY WORDS: Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, rules, and weights is optional.

GPO 886-551